ABSTRACT OF THE DISCLOSURE:

The aim of the present invention is to estimate EDR directions in a

5 single index model composed of a large number of variables with simple

calculations without using the inverse matrix of the variance-covariance

matrix and principle component analysis. Data conversion means 21

receives, from an input device 3, data to be analyzed, the data composed of

sets of response variables and explanatory variables, standardizes the

10 explanatory variables, and sends them to slice average calculating means

22. The slice average calculating means 22 divides the data into two slices

with reference to the median of the response variables to calculate the mean

vector of the explanatory variables on a slice basis. The calculated mean

vectors are sent to EDR direction calculating means 23. The EDR direction

15 calculating means 23 calculates the difference between the mean vectors for

respective slices to estimate an EDR direction. The EDR direction

calculating means 23 also corrects the estimated EDR direction using the

inverse matrix of the correlation matrix of the explanatory variables, if any.

Both the estimated EDR direction and the corrected EDR direction are sent

20 to the data conversion means 21, and transformed by the data conversion

means 21 into the original coordinate system.